Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

COVID-19 and the digital divide in the UK

Any health-care development that doesn't rapidly become available to all individuals has the unintended but inevitable consequence of fuelling health inequality. The response to COVID-19 is no exception. Although we have neither effective drugs or vaccines to deploy, we do have other resources that bear on our capacity to respond to the disease: resources that include digital health-care technologies. Regrettably their benefits are still far from being equitably distributed.

The advent of COVID-19 has thrown a spotlight on this digital divide, most obviously in everyday domestic life—though not exclusively so. Many patients who do not have COVID-19 in the UK, fearful of acquiring the infection, have been reluctant to enter hospital buildings. Attendances have shown a marked fall. Many outpatient consultations can of course be done online—but only if you have access to a computer. So might deepening the concern over the consequences of digital exclusion eventually act as a spur to efforts at overcoming it?

Technological exclusion is not a new phenomenon. Writing in the journal *Demography* in 2008 about the experience of innovation globally, Glied and Lleras-Muney hypothesised that "improvements in health technologies tend to cause disparities in health across education groups because education enhances the ability to exploit technological advances. The most educated make the best use of this new information and adopt newer technologies first." Education is one of many factors contributing to digital exclusion. But whatever the cause, knowledge and behaviour gaps created in this way have often shown a depressing tendency to remain unbridged for years, and sometimes for decades.

The full extent of digital inequity is no mystery. A 2019 report by the Office for National Statistics (ONS) revealed that, although declining, the number of "internet non-users" is still large in the UK. In 2018, there were 5·3 million internet non-users in the UK: 10% of the adult population.

Yet many organisations, not least among them governments, still proceed as if access to the internet is already universal. "They do," Professor Simeon Yates, who is the joint-chair of the UK Government Department of Digital, Culture, Media and Sport working group on digital inclusion and skills, told *The Lancet Digital Health*. "It's a constant battle we have when we're trying to point to research evidence… Don't ever start from the assumption that everybody's online."

Helen Milner is Chief Executive of the Good Things Foundation, a UK charity set up to make the benefits of digital technology more accessible. Health inequality has worsened in the past 10 years, she told *The Lancet Digital Health*, and digital exclusion plays into that trend. "There's a massive overlap between digital exclusion and social exclusion, and then social exclusion and poverty, and poverty and health inequalities."

The lockdown strategies in the UK prompted by the COVID-19 pandemic are actually increasing digital inequality, according to Kira Allmann, Research Fellow in Media Law and Policy at Oxford University's Centre for Socio-Legal Studies. She spoke to *The Lancet Digital Health* about the closure of public libraries and online learning centres. "These are important for people without access to digital technology or with low digital skills." Their role in what she calls "the front line" of the struggle to overcome the digital divide is currently being lost.

The barriers by which people are excluded are equally apparent. Milner puts them into three broad categories: lack of access, mostly on account of an inability to pay for devices and their running costs; lack of motivation among people who do not believe that connectivity is relevant to their lives or worth the effort; and lack of digital skills and education.

So how best to bridge the digital divide in the UK? Simply giving people the right equipment or access to it is not enough, says Allmann. "The solutions have to involve human intervention, commitment, and care." What is needed, she adds, are "intensive, long-term support networks to help people acquire the digital know-how they lack… People helping people."

The effects of digital exclusion on health are mostly the result of difficulties in obtaining information and acting on it. More than half of the people surveyed in the 2019 ONS report listed "looking for health-related information" as one of the key uses of the internet. As a means of communication between public authorities and the general public, the internet is increasingly the channel by which services are publicised and accessed. Booking medical appointments, having distant medical consultations, and acquiring prescriptions electronically are just three health services that are already common, and can be vital at a time when lockdown plays a central role in the response to COVID-19.

A lack of access to digital technologies during lockdowns has implications beyond daily practicalities. "It has consequences for well-being and mental health," says Milner. "Being able to connect with other people is critical."

The precise effects of digital exclusion vary by country, but Allmann emphasises that its impact is universal. "It's a complete misconception that digital exclusion only exists in certain contexts and certain places," she insists. "It's an issue that all countries need to address. There's more similarity between the digital inequalities that exist in Egypt and the digital inequalities in the UK than you might expect."

This online publication has been corrected. The corrected version first appeared at thelancet.com/digital-health on October 25, 2022

For more on **technological exclusion as a result of global innovation** see Glied S, Lleras-Muney A. Technological innovation and inequality in health. *Demography* 2008; **45:** 741–61. https://link.springer.com/article/10.1353/dem.0.0017

For more on the **ONS 2019 report exploring the UK's digital divide** see https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/articles/exploringtheuksdigitaldivide/2019-03-04

For more on the **2020 survey of internet user statistics for Asia** see https://www.internetworldstats.com/asia.htm

For more on the **2020 survey of internet user statistics for Africa see** https://www.internetworldstats.com/stats1.htm

For more on the **2017 After Access Survey** "Let the people speak: using evidence from the Global South to reshape our digital future" see http://afteraccess.net/wp-content/uploads/AfterAccess_IGF2017v2_1.pdf

For more on the **blog post by the director of the Digital Healthcare Council, Graham Kendall**, see https://www.digitalhealth.net/2020/03/strike-while-the-iron-is-hot-why-we-need-to-go-further-on-digital-health/

For more on the **World Wide Web and recognising the internet as a human right** see https://webfoundation.org/2014/12/recognise-the-internet-as-a-human-right-says-sir-tim-berners-lee-as-he-launches-annual-web-index/

The problems and consequences of digital inequality might indeed be similar—but differences in the extent of knowledge and usage are pronounced. The biggest and least surprising global difference is between lower-middle-income and high-income countries; the majority of the 46% of the world's population who remain unconnected to the internet live in low-income countries. Less well documented are the digital inequities within and between those countries. A 2020 survey of internet usage statistics for Asia revealed that 70% of the population in Vietnam use the internet, whereas the figure for Myanmar is just 33%. Likewise, 61% of the population in Nigeria have internet access, but only 10% of Burundians and 8% of Eritreans. Differences within countries are also marked. A similar survey of internet access and usage published in 2017 found that 43% of Bangladeshis living in urban areas were at least aware of the internet, whereas the figure for rural dwellers was 30%.

These problems notwithstanding, might the spotlight that has now been shone on all digital things serve to boost the drive for greater equality? The response of the health technology sector itself has, not surprisingly, been bullish. In a blog post , Graham Kendall, the director of the Digital Healthcare Council, which aims to champion the role of digital technology in the UK, argues that "the spotlight on digital health may, if we get it right, lead to profound long-term changes for our health services." He could be right; but reaping the full benefit still depends on being able to achieve greater digital inclusion.

Yates agrees that COVID-19 has highlighted digital inequality, but he is not holding his breath in anticipation of fundamental change. "Lots of things have highlighted digital inequality over the past 20 years," he reflects, but adds that when it comes to tackling it, "We do now seem to have hit the hard-to-reach [sector]." That said, he remains optimistic and thinks that COVID-19 will at least push exclusion up the political agenda.

Yet Milner, having said that she too senses "an overall greater awareness that digital inclusion is important," is less certain that this awareness will be followed by more funds and more action. Her hope is that if the digital divide's many consequences are now seen to impinge on more areas of life than had previously been realised, the pressure for action will be correspondingly greater. Sir Tim Berners-Lee, the engineer who invented the World Wide Web, has long argued that access to it should be viewed, like water or electricity, as a human right. For the moment, though, less ambitious goals seem more realistic.

It is clear that regions that responded most successfully to COVID-19 were those that had experienced SARS, as they were conscious that something similar might happen again, and had forearmed themselves accordingly. Singapore and Taiwan, for example, launched mobile contact tracing apps in time to help stall the growth of their epidemics. The possibility that the current COVID-19 outbreak is an event likely to be repeated is chilling, but one that should prompt even greater efforts to abolish the digital divide.

Geoff Watts